

CLAIMS

1 1. A method of regulating methanol concentration in a direct methanol fuel cell sys-
2 tem comprising:

3 providing a concentration regulator, coupled to a source of methanol or a source
4 of water or both, and responsive to a control signal for increasing or decreasing the con-
5 centration of methanol supplied to a fuel cell;

6 periodically short-circuiting a load driven by said fuel cell;

7 sensing the short circuit current produced by said fuel cell;

8 comparing said sensed current to a reference; and

9 generating said control signal in response to said comparison.

1 2. The method as in claim 1 wherein one or more of said sensing, comparing and
2 generating steps is performed by a microprocessor or microcontroller.

1 3. A direct methanol fuel cell system comprising;

2 a direct methanol fuel cell;

3 a source of air or oxygen coupled to the fuel cell;

4 a source of methanol;

5 a source of water;

6 a detector for detecting changes in a short circuit current produced by said fuel
7 cell and responsively producing a control signal; and

8 a concentration regulator coupled to the methanol source or to the water source or
9 to both sources, detector and anode of said fuel cell, responsive to said control signal for
10 varying the concentration of methanol in said fuel cell.

1 4. The system as in claim 3 wherein said concentration regulator comprises a me-
2 tering valve, a pump, or a combination thereof.

5. A method of regulating methanol concentration in a direct methanol fuel cell sys-
tem comprising:

providing a concentration regulator, coupled to a source of methanol or a source of water or both, and responsive to a control signal for increasing or decreasing the concentration of methanol supplied to a fuel cell;

sensing one of a group of fuel cell operating characteristics including potential
5 across a load driven by said fuel cell, potential across a portion of a fuel cell stack, potential at a portion of an anode of said fuel cell which is proximate to an end of a methanol flow path, an open circuit potential of said fuel cell, a short circuit current of said fuel cell and, periodically, alternately sensing another one of said group of fuel cell operating characteristics; and

10 using said alternately sensed operating characteristics to control a concentration of methanol in said fuel cell.